CRITICAL SUCCESS FACTORS OF DIGITIZATION OF VITAL RECORDS AT CIVIL REGISTRATION DEPARTMENT IN NAIROBI COUNTY, KENYA

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ABSTRACT

Many births and deaths go unreported despite there being governing regulations and procedures for notification and registration of these vital events. Aware that the Civil Registration and Vital Statistics (CRVS) system in Kenya has not attained complete coverage of births and deaths, the government is implementing strategies aimed at improving both coverage and quality of vital statistics as outlined in the Civil Registration Department Strategic Plan 2013 2017 (Kenya Vital Statistics Report, 2015). The study sought to determine the effect of people-related ICT factors on digitization of vital records at Civil Registration Department in Nairobi County, Kenya. The study focused on Nairobi County as it is the most populated as per the Kenya National Bureau of Statistics (KNBS) census of 2019, has its own civil registration department as well as the department's headquarters which has copies of all birth and death records from all the other counties. The target population was 100 civil registration officials; four registrars and 96 registration officers from the Ministry of Interior and Coordination of National Government, Civil Registration Department in Nairobi at Bishop's House-Community. A census of all the Civil Registration Officials was conducted 70 of whom filled and returned the questionnaires making a response rate of 70%. Primary data was collected using questionnaires, processed and analysed using descriptive statistics including frequencies, percentage, mean and standard deviation and presented using tables, pie charts and bar charts. Correlation analysis was employed to determine if there was a relationship between the variables. Multiple regression was used to test the relationship between independent variable and dependent variable of the study. Findings from multiple regression analysis revealed a negative and non-significant relationship between people-related ICT factors and digitization of vital records at the Civil Registration Department, Nairobi County. The study recommends that the management should be more transparent and accountable in the way they handle the employees and be more approachable so that they are able to listen to employee's opinions and incorporate these opinions when need be thereby having their 'buy-in' when they want to implement changes within the department.

Key Words: *critical success factors, digitization, vital records, civil registration department, Nairobi County, Kenya*

INTRODUCTION

Digitization is the process of taking record materials, typically in the form of papers, and converting them to electronic form where they can be stored and manipulated by a computer Witten and Bainbridge (2003). Digitization not only helps in reducing bulkiness of paper work, it also improves access and indexing, searching and retrieval of records. Digitization will provide better ordering for searching and retrieval, permit validity checks for data quality, research, and especially decision support. Digitization of birth and death records will ensure

that the information within the CRVS system is precise and up to date so as to aid in matters of economic, social and health planning in Kenya in future. Namande (2012), outlines the benefits of digitization as: multiple access to information, resource sharing, preservation and space. Most countries have the legal obligation for registering births of children but these registration systems are not used fully due to lack of oversight especially in isolated rural areas where births occur away from medical facilities. According to the UNICEF birth registration fact sheet, there exists deliberate exclusion of particular communities due to discriminatory policies intended to minimize the size of ethnic minorities for political reasons or avoid the provision of assistance to immigrants UNICEF (2003).

In developed countries all children are registered at birth and all people are registered when they die with a medically assigned cause of death by the institutions where these births and deaths take place and the only involvement is limited to choosing the name of the child and signing the registration papers (UNDP, 2015). Developed countries have already established effective civil registration systems which vary greatly across the various countries but all serve a general purpose of documenting births, deaths and other vital events. These systems also serve the statistical purposes of forming the basis of essential demographic variables of the birth rate, death rate according to various geographic, social, economic and demographic factors.

Although many developing countries have achieved universal rates of registration, for example, 100 per cent in Bosnia and Herzegovina, Cuba, Ukraine and Uzbekistan, there still are countries with rates of 10 per cent or less Alarcón, Diana and Robles (2007). In Africa, there have been several efforts in the past to improve the coverage and completeness of civil registration and vital statistics systems. Numerous attempts have been made in the past to improve civil registration and vital statistics systems in African countries where most were project-based and mostly focussed on the collection of statistics rather than on a coordinated and holistic approach to strengthening the system resulting in incomplete civil registration and vital statistics systems (UNDP, 2015). Currently, millions of people in Africa and Asia are born and die without leaving any trace in legal records or official statistics because these systems have stagnated over the past 30 years (WHO, 2013).

In Kenya, the vital events registered by the Civil Registration Services (CRS) include all births (live and still births) and deaths, including cause of death (lay reported and clinician-certified). The information provides significant input needed to assess demographic dynamics such as changes in population size and composition including age, sex structure and socio demographic characteristics (Kenya Vital Statistics Report, 2015). Families are responsible for the registration of the birth or death which requires substantial effort and expense and can take several weeks.

STATEMENT OF THE PROBLEM

Access to government services in the 1980s was limited to the wider public, leading to frequent public outcries and displeasure in service delivery. This access was limited due to a wide range

of reasons, including corruption practices by civil servants, unreasonable delays in getting desired services, chronic absenteeism, poor record keeping and retrieval and poor customer care Abdalla (2015). There have been numerous cases where people have gone to get birth and or death certificates and have been told that the records cannot be traced due to poor storage of the registers resulting in opportunities for corruption as bribes are offered in order for these same records to be 'located' leading to frustration for the clients who are in need of these vital records. The manual system of searching for vital records (birth and death at the civil registration department does not permit multiple use by different users. It is inefficient and time consuming, hence the need to exploit the advantages of digitization which will enable provision of services to clients in a timely fashion. Birth and Death records captured by the assistant registrars on manual forms are transported periodically to the district offices and eventually to the headquarters for verification. This takes a long duration for timely consolidation and generation of statistics. There are inaccuracies in data capture, as a result of using many administrative forms for processing the registration which result in unavailability of the registration materials and corrections of erroneous records which is tedious and time consuming. A study by Kimotho & Oluoch (2016), found out that the factors responsible for the low citizen registration can be attributed to lack of human and financial resources (specifically lack of transparency, accountability and bureaucracy in the national registration office), disjointed legal and policy framework and low level of integration amongst registration agencies. Previous studies related to digitization such as Wangui (2011) observed the benefits accruing from digitization such as less storage space, ease of access and speedy delivery of service and the need to embrace digitization as an efficient and effective method of records management while Bosibori (2013), determined the key barriers for government digitization as financial constraint, inadequate personnel, poor handling of original documents and inadequate infrastructure. Two of the three studies looked at the challenges of digitization in government but did not take into account the Critical Success factors of digitization of Vital Records at Civil Registration Department in Nairobi County, Kenya.

OBJECTIVE OF THE STUDY

The overall objective is to determine the effect of people-related ICT factors on digitization of vital records at Civil Registration Department in Nairobi County, Kenya.

THEORETICAL REVIEW

Diffusion of Innovation (DOI) Theory

While explaining Diffusion of Innovation Theory, Rogers (2010) defined diffusion as the process by which an innovation is communicated through certain channels over time among the members of the social system. Sun and Yearwood (2014), describe innovation as an idea, practice or object that is perceived as new by an individual or another unit of adoption, maintains that diffusion of innovation has five characteristics namely; relative advantage, compatibility, complexity, trialability and operability. Sun and Yearwood explain that relative

advantage is the degree to which an innovation is considered as better than the idea it replaced; compatibility is the degree to which an innovation is considered as being consistent with the potential end users, existing values, prior experiences and needs; complexity is the end users perceived level of difficulty in understanding innovations and their ease of use; trialability is the degree to which innovation can be tested on limited basis and observability is the degree to which the result of an innovation can be evident to people. Digitization in the CRD is considered an innovation since it's a new idea to registry staff in carrying out their duties and it has been diffused throughout the 108 stations of the department countrywide. Digitization meets most of the characteristics of diffusion such as compatibility, ease of use, relative advantage and observability which will determine the adoption or rejection of digitization by the CRD.

Theory of Planned Behavior (TPB)

According to Vadlamani (2007), the Theory of Planned Behavior (TPB) is one of the most influential and well supported social and psychological theories for predicting human behaviour. The central principle of this theory is that behavioural decisions are not made spontaneously but are as a result of a reasoned process in which behaviour is influenced although indirectly by attitudes, norms and perceptions of control over the behaviour. The model proposes that attitude (the evaluation of the target behaviour), subjective norms (perceived social pressure regarding performance of the behaviour), and perceived behavioural control (perceived control over performance of the behaviour) influence behaviour primarily through their impact on behavioural intention. Hence, intention is seen as the proximal determinant of behaviour. Perceived behavioural control (PBC) is thought to have both a direct effect on behaviour and an indirect effect via intention (Vadlamani, 2007). TPB will be helpful in understanding registration assistant's behaviour towards digitization and not falling back to earlier methods of operation such as using typewriters to fill in the details in the certificates, retrieving records physically instead of electronically at the registries in order to cater to their customers.

EMPIRICAL REVIEW

People related ICT factors

According to Burnes (2008) top management support is the most fundamental success factor in any organization. Goodstein and Burke (2001) indicated that the top management should inspire and motivate its employees towards change, reward and recognition should be accorded to the best performing employees as a way of encouraging the other employees to work extra-harder. Top management acts as role models by representing all the interest of the stakeholders; they act as agents of change through leading by examples in guiding employees in execution of their roles and responsibilities.

Motivation is divided into two (intrinsic and extrinsic). Intrinsic stems from inside and occurs when people are internally motivated to do something because it either brings them pleasure,

they think it is important, or feel that what they are learning is significant while extrinsic motivation is triggered by the environment or the surroundings and comes into play when someone is compelled to do something or act in a certain way because of factors external to him or her like money or promotion (Freyermuth, 2012). Motivated employees are more likely to be satisfied with their job and they exhibit pleasurable behavior, produce high quality goods and services and are always yearning to carry out tasks and duties assigned to them. They are on the lookout for new opportunities and new challenges and as they do so, they bring new ideas which promote company growth, expansion and high productivity (Hoot, 2012). Use of rewards may either encourage or diminish motivation, depending on the type of rewards and the context in which they are given. Employers should attempt to give employees more autonomy or control over their own performance by allowing them to make choices (Owolabi & Makinde, 2012).

User involvement is considered to have a significant effect on successful implementation of Information Technology projects (Nwakanma et al., 2013). The study collaborates with study by Fayaz, Kamal, Yasir, Amin, Saif, Khan and Samandar (2017) to determine the critical success factors (CSF) of IT projects in Pakistan which revealed that user involvement powerfully has an effect on IT projects success. According to Beringer, Jonas, and Kock (2013), stakeholder conduct and management of such conduct is critical to project portfolio success. From the project owners' point of view, Eskerod and Jepsen (2013) confirmed stakeholders play a critical role in a project and hence a project's success can only be guaranteed if stakeholders are first inspired and in return have been part of the project. A study conducted by Imtiaz et al., (2013) concluded that user involvement has a strong effect on success of IT projects.

Digitization of Vital Records

Digitization of information is quite valuable and economical for the present day society. Though the process of digitization at its preliminary stages is not considered economical, its inexpensive impact can be realized in later stages, in terms of increasing returns, zero marginal cost and long-term usage of digitized content by the larger community. Despite digitization being expensive at the initial level such as document preparation, scanning of documents, well-edited text and navigational aids, fast hardware, software packages and good connections-bandwidths, continual migration to new technology; it saves much of the production costs and reasonable in comparison to the conventional form of distributing system of information. Digitization costs result from the staff digitizing the work, the computer system(s), equipment used in digitizing the documents such as high speed scanners and computers.

Sabbagh et al (2012) measured digitization for a sample of 150 countries on a scale of 0 to 100, with 100 being the most advanced with four distinct stages of digitization development as constrained, emerging, transitional and advanced. The authors observed that these groupings would allow policymakers to recognize their nation's current level of digitization and provide perspective on how to progress. In the constrained economies whose digitization score was below 25 faced challenges in realizing basic digitization building blocks such as widespread

access and affordability. In these countries, services remained expensive and limited in reach. In emerging economies that had a score between 25 and 30 which had largely addressed the affordability challenge and had achieved significant progress in providing inexpensive and widespread access. However, reliability of services in emerging digitization nations remained below par and capacity was limited. The study by Sabbagh et al (2012) also revealed that transitional was the next digitization stage, encompassing those countries with a digitization score in the range of 30 to 40. Countries in the transitional stage had addressed the reliability challenge and provided citizens with access to ubiquitous, affordable, and reasonably reliable services. Alongside the jump in reliability, transitional countries showed minor advances in the speed, usability, and skill indexes. Advanced was the most mature stage of digitization, achieved with a score greater than 40. These countries had made significant strides in addressing ICT usability and developing a talent base to take advantage of existing technologies, products, and services while improving the speed and quality of digital services.

RESEARCH METHODOLOGY

Research design

De Vaus (2001) defines a research design as a design that ensures that the evidence obtained enables us to answer the initial questions as unambiguously as possible. Kothari (2004) describes descriptive surveys as formalized and typically structured fact-finding enquiries, that involve asking questions to a group of individuals, adding that the major purpose is description of the current state of affairs as it exists at present and describe "what exists" with respect to variables or conditions in a situation. Descriptive survey design will be adopted for this research because it will be used to quantitatively describe specific aspects of the population. These aspects will involve examining the relationships among variables. The study will use a census of the population, which is Civil Registration Department in Nairobi County. Civil Registration Departments are similar throughout the Country in terms of the services they offer, share similar policies and are financed and facilitated by the government.

Target Population

Burns and Grove (2003) and Mugenda and Mugenda (2003) describe population as all the elements that meet the criteria for inclusion in a study. The target population is a complete set of individuals to which a researcher wants to generalize the results of the study. Population is therefore the entire group of individuals, events or objects having a common observable characteristic. The target population was 100 civil registration officials; 4 registrars and 96 registration officers from the Ministry of Interior and Coordination of National Government, Civil Registration Department in Nairobi at Bishop's House-Community and Hass plaza-lower hill CRD Human resource department, (2018). Nairobi was chosen because it accounts for a majority of the CRD registration officers due to the fact it is the headquarters and handles records from Nairobi county and copies of all other counties in Kenya.

Sample Size and Sampling Technique

Sampling is the process of selecting a number of individuals for a study in such a way that the selected represents the large group from which they are selected. A census enables a complete enumeration of all items in the population Oso & Onen (2006). For this study, a census of the registrars and registration officers was conducted at the Civil Registration Department in Hass plaza and Bishop's House-Community.

Data Collection Instruments

The data to be used for the purpose of this study was primary data collected by the researcher, through questionnaires. Saunders et al. (2009), define a questionnaire as a general term including all data collection techniques in which each person is asked to answer the same set of questions in a predetermined order. In this study, the questions were constructed using Likert's 5 Point Scale based on the study objectives. Each item is a stand-alone statement that expresses an opinion about a subject (McNabb, 2008). The questionnaires included both open and closed ended questions because of the flexibility in designing of questions so that the respondent(s) can have ease in answering the questions. The questionnaire was constructed in such a way as to require direct answers in a particular prescribed format which will facilitate consistency of responses among respondents, Oso & Onen (2006). The first section of the questionnaire dealt with demographic statistics such as name, age, level of education and year(s) of service of employees. This information provided data to be used in analysing personal statistics based on gender, age and employee years of service. The second section of the questionnaire sought to gain an understanding of the various critical success factors in the digitization of the vital records at the civil registration department.

Data Collection Procedure

Data was collected using a questionnaire, since it can be used to collect data about phenomena that is not directly observable (like inner experiences, opinions, values and interests), it is easier to administer, analyse and economical in terms of time and money. The questionnaires were issued to the respondents through informal self-introduction on a drop-and-pick mode.

Data Analysis and Presentation

Data analysis was conducted according to the research objectives. The process entailed the following; gathering of all the questionnaires issued to respondents, checking for completeness on questionnaires, entering coded numerical data in templates so as to calculate the response percentages, mean and variance and checking data for errors. According to Kothari (2011), analysis refers to the computation of certain measures along with searching patterns of relationships. The quantitative primary data was analysed using descriptive statistics including frequencies, percentage, mean and standard deviation using the Statistical Package for Social

Science version 20 (SPSS) software. The study mainly used tables, bar graphs and pie-charts in analysis. This allowed a better interpretation, conclusion and recommendation.

RESEARCH RESULTS

The objective of the study was to examine the effect of people-related ICT factors on digitization of vital records. Correlation results indicated a significant positive relationship between people-related ICT factors and digitization. On the other hand, regression analysis results indicated that the relationship between digitization of vital records and people-related ICT factors was negative and not significant which implies that people-related ICT factors does not have a significant influence on digitization of vital records. This study therefore concluded that people-related ICT factors did not significantly influence digitization of vital records at the Civil Registration Department, Nairobi County.

The study used inferential statistics to determine the relationship between the variables which includes correlation and multiple regression analysis. According to Kothari (2011), Karl Pearson Correlation Coefficient is the most widely used method of measuring the degree of relationship between two variables. It ranges from -1 to +1. A correlation coefficient of -1 indicates a perfect negative correlation, 0 indicates no correlation while +1 indicates a perfect positive correlation. It tells a researcher the magnitude and direction of the relationship between two variables.

Table 1: Correlation matrix

		People-related	**Digitization**
People-related	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	70	
Digitization	Pearson Correlation	.964**	1
	Sig. (2-tailed)	.000	
	N	70	70

**. Correlation is significant at the 0.01 level (2-tailed)

The results indicated a significant positive relationship between people-related ICT factors and digitization, $r(68) = 0.964$, $p < 0.01$. The correlation was significant at the significance level of 0.05. The findings concur with Burnes (2008) top management support is the most fundamental success factor in any organization.

Regression is used to determine a statistical relationship between two or more variables (Kothari, 2011). The study adopted multiple regression analysis to test the relationship and the overall influence between the independent variable and dependent variable. The results of regression analysis are presented in Table 2.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Regression	0.986[a]	0.973	0.971	.15925

Predictors: (Constant), people-related

A multivariate regression model was used to test the relationship of all the independent variable and the dependent variable. The results indicate that R = 0.986 and R square = 0.973. R value indicates that there is a strong relationship between people-related ICT factors and digitization of vital records at the civil registration department, Nairobi. R2 indicates that the explanatory power of the independent variables was 0.973 which means that 97.3% of the variation in digitization of vital records is explained by changes in the independent variable (people-related ICT factors) while 2.7% of the variation in digitization of vital records is unexplained and it's a result of other variables not included in the model.

Table 3: ANOVA

Model	Sum of squares	df	Mean Square	F	Sig
Regression	59.337	4	14.834	584.956	.000[b]
Residual	1.648	65	0.025		
Total	60.986	69			

Dependent Variable: Digitization
Predictors: (Constant), Policy-related

The ANOVA findings presented in Table 3 revealed an F-statistic of 584.96 with a p value of 0.000 which was less than significance level of 0.05 which implies that the critical success factors identified in this study have significant influence on digitization of vital records. The study concluded that the model used to link the independent to dependent variable has goodness of fit. The findings further showed that people-related ICT factors, process-related ICT factors, technical-related ICT factors and policy-related ICT factors were good predictor variables of digitization of vital records at the civil registration department, Nairobi.

Table 4: Regression Coefficients

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	0.083	0.090		0.929	0.356
People related	-0.090	0.146	-0.104	-0.617	0.539

Dependent Variable: Digitization

Based on the analysis, the regression equation for the independent variables on the dependent variable resulted to

$$Y = 0.083 - 0.090 X_1 + \varepsilon$$

Where: Y = Digitization of vital records; X_1 – people-related ICT factors

The relationship between digitization of vital records and people-related ICT factors was negative and not significant (β= -0.090, p value of 0.539) with a p value > 0.05 which implies

that people-related ICT factors does not have a significant influence on digitization of vital records.

CONCLUSIONS

Findings from multiple regression analysis revealed a negative and non-significant relationship between people-related ICT factors and digitization of vital records at the Civil Registration Department, Nairobi County. This however, is contrary to previous studies reviewed herein and the study concluded that people-related ICT factors were important to digitization as shown by respondents who were of a similar opinion and their responses to the questions were agreeable to statements such as: management decisions were transparent, team members clearly understood their roles, they had the required information and tools to do their job(s) properly.

RECOMMENDATIONS

The study recommends that the management should be more transparent and accountable in the way they handle the employees and be more approachable so that they are able to listen to employee's opinions and incorporate these opinions when need be thereby having their 'buy-in' when they want to implement changes within the department; more consultations on the challenges faced by the registration officers by the registrars during their day to day activities in a bid to ensure they serve their customers better.

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